INFLUENCE

OF

THE MECHANIC ARTS

ON THE

HUMAN RACE.

Two Lectures.

DELIVERED BY

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TO

THE MECHANICS

OF

THE STATE OF LOUISIANA

THESE TWO LECTURES

ARE

RESPECTFULLY DEDICATED

BY THE AUTHOR.

FIRST LECTURE.

Ladies and Gentlemen:—The influence of the Mechanic Arts on the destinies of the human race is a subject so comprehensive, that it requires the utmost power of condensation, to compress even a faint outline of it within the space allotted to the two Lectures which I have undertaken to deliver. The history of the Mechanic Arts would be the history of man himself, in all the various phases of civilization, the modifications of society and the transformations of polity through which he has passed during so many centuries of his recorded existence, and should conclude with a prophetic survey of their progressive results through ages to come. It is impossible to do justice in a few pages to a subject so vast in its conception, so complicated in its applications, and so infinite in its deductions; and it could not even be done, if permitted to enter upon it on a more extensive scale, unless with the possession of an amplitude and energy of intellect which, although occupying in the narrow cell of the brain no more

space than would fill up a lady's glove, could, in obedience to volition, and in imitation of the tent given by the fairy Paribanou to prince Ahmed, spread itself as wide as the canopy of heaven. This elastic texture of the mind, which, dilating without bounds, could be commensurate with the universe, and which would be so necessary to the proper accomplishment of such a task, was once possessed by a man who, at the age of thirty-one —nay—however advanced might have been his time of life, could alone have written, without provoking a sneer at his consummate presumption: "I have taken all knowledge to be my province." Need I name Bacon, of whom Macaulay has so beautifully said: that the glance with which he surveyed the intellectual universe resembled that which the archangel, from the golden threshold of heaven, darted down into the new creation:

> Round he surveyed—and well might, where he stood
> So high above the circling canopy
> Of night's extended shade—from eastern point
> Of Libra, to the fleecy star which bears
> Andromeda far off Atlantic seas
> Beyond the horizon.

Art is defined by that illustrious man, "as a proper disposal of the things of nature by human

thought, labor and experience, so as to answer the several purposes of mankind." Physical or intellectual Labor, whatever it be, could not but suggest certain rules by which its operations could be performed with more facility, more skill, and with less loss of time. Those rules were next systematized, arranged, and classified as the results of repeated and progressive experiments. These systems regulating the operations of the mind and body, in compelling nature to become the handmaid of mankind by ministering to its wants, gave rise to a decomposition of the meaning primitively attributed to the generic word: Art. Born with man, like man, it went forth and multiplied, and became subdivided into parts or branches originating from the same trunk and called the useful or mechanic, the fine or liberal arts.

The former are said to be "those wherein the hand and body are more concerned than the mind; of which kind are most of those which furnish us with the necessaries, and are properly known by the name of trades. The latter are such as depend more on the labor of the mind than that of the hand; they are the produce of imagination and taste, and their end is pleasure." But is there sufficient clearness and precision in

this definition? Where is that point, in the exercise of the arts, which ceases to be debatable territory between the powers of the mind and those of the body? At what definite moment does the one predominate over the other? Take the Mechanic Arts for instance. Every one of them is composed of two elements—speculation, gradually growing into theory—and physical labor, daily ripening into practice and habit. But what is practice, if not the result of thought and the application of speculation, be it done consciously or unconsciously by the mechanic! Conception is the first step—action the next, and when the fruit of both has come to maturity, how can we tell the exact period of its formation when the material power predominated over the ethereal!

The man who first invented a tool which we may now look upon as a very ordinary one was an artist, because in its production there must have been a greater exertion of mind than muscle; although the one who copied it is a mechanic, if we adopt without qualification the definition I have quoted. But when that mechanic is at work, how do we know, at the time we look at him and give him that name, whether or not he may not be at that moment more engaged in an

intellectual than a physical operation? How do we know that the individual who is heaving up the hammer, or driving the plane on a common board, and pursuing an occupation so humble that it is apparently unconnected with any exercise of the mind, is not theorizing about it, without perhaps being aware himself of the mental process he applies to his manual labor, and by which he may suddenly strike out some wonderful improvement, by chance, as it is commonly said, or seemingly, by a flash of inspiration? How do we know, when we only see bodily fatigue pearling out into drops on his bent brow, and exhaustion thickening his panting breath, that, whilst his arms work, he is not weaving comparisons, pursuing a train of deductions and inductions, discovering connections between particular operations, and lifting up his foot to step beyond the line of mere habit? How do we know that practice in him is not spiritualizing itself into speculation and theory, just as that rough material on which he is plying may be one day dissolved into an invisible gas, at the magical touch of science? How do we know that his sooty hand is not already on the latch of the door which he is to open to that splendid procession of improvements which is waiting outside—that

he is not ceasing to be a mere unreflecting piece of flesh and bone machinery, and is not ascending the pedestal of invention—that he is not going to rise to the dignity of a benefactor of his race, —and that on the hitherto clumsy work on which he had been apparently bestowing only physical labor, he is not now ready to stamp an eternal impress—the token of the sovereignty of the intellect—and make it the Cæsar's coin that will pass current throughout the world.

Thus the Mechanic Arts may gradually emerge from that kind of twilight to which they have been confined by the common prejudice of mankind, and may brighten up and expand into as glorious an illumination as ever was produced by the fine arts. Thus may the mechanic secretly feel that he is unfolding the wings of intellectual ascension, when still in the estimate of his fellow beings he is plodding the dull earth, and when, agreeably to the terms of an accepted definition, which is not more accurate than most definitions, he is engaged in a work "in which the hand and the body are more concerned than the mind." This reflection must be consolatory and encouraging for those who exercise those useful arts which have so long undergone unmerited depreciation.

Look at those two men who are making bronze

pitchers. Who are they? Mechanics; will say the inattentive host of those who pass by. But what is called a man of taste happens to stop. He pays no regard to one of those workmen, and bows with reverence to the other. Why?—because the one, in his opinion, is a vulgar mechanic, and the other, Benvenuto Cellini—the great artist. Yet, for the crowd they were both alike—both engaged in the same operation—and both held brothers of the same trade before the distinction of superiority, perhaps accidentally discovered or acknowledged, had set them so far apart. But what is that degree of skill to which the other pitcher maker and chaser must attain, before he may be permitted, like his companion, to merge the mechanic into the artist, although he may never arrive at the same excellence? Who can say? And besides, what is the precise amount of taste required, to justify the issuing of such a verdict, to entitle it to be recorded, and to cause it to be respectfully carried into execution?

Look into a different direction, where two men are stuffing capons. Can there be a less exalted occupation? Who is the one on the left? A mechanic. And the other on the right, is he of the same tribe? Oh no!—It is Fran-

cis Bacon, the Lord Chancellor of England, stuffing a fowl with snow, to make an experiment, and applying his favorite process of induction, in order to "enlarge the bounds of human empire," through an operation which, apparently, is only mechanical. Thus it is within the power of man, to ennoble even the stuffing of a capon, to cause mind to predominate over physical labor even in the improvement of a wheel, and to convert the mechanic art into the liberal art—that in which, according to the received opinion, the intellect is more concerned than the body. I hope that, in these two short illustrations, you will find a meaning and a morality, without further observations on my part.

Within the wants which God gave to our race lay concealed the roots of the Mechanic Arts, many of which must have been coeval with man. They were to keep pace with the progressive development of his intellect, as a condition of his existence. Wants increase with their gratification, and produce others which have the same cravings. Whatever were the original scantiness and simplicity of food, clothing, and habitation, to provide for them required a combined exertion of the body and of the intellect—which

is—art—in all the imperfection, it is true, of its primitive rudeness, but yet producing a more or less "proper disposal of the things of nature by human thought, labor, and experience, so as to answer all the purposes of mankind" at the time. For instance, the making of the bow and the arrow is a mechanical operation; but he who first made a bow and arrow cannot be said to have been a mechanic, for its invention and practical application demanded a combination of thought far superior to the physical labor bestowed on the weapon. So impressed with this belief was mankind, when in its infancy, and even when beginning to bloom into the adolescence of civilization, that all inventions, however simple they may appear to us now, were attributed to Gods and Goddesses, or at least to emperors and empresses, and to the most exalted of the human race. Thus spinning was ascribed by the Egyptians to their Goddess Isis, by the Greeks to Minerva, by the Peruvians to Mama Ella, wife of their first sovereign Mango Capac, and by the Chinese to the wife of the emperor Yao. Scythos, the son of Jupiter, was thought to have invented the bow and arrow, and you know that Bacchus, himself a God, and the son of the greatest of the Gods, was the first vine-

dresser. These illustrations are sufficient; your own erudition will supply you with the rest, if necessary.

Thus, in the Mechanic Arts, as in man from whom they emanate, and without which he could not fulfil his destinies, there is a duality—theory and practice—soul and body—practice or physical execution which, like the body, is restrained within certain proportions—and theory, which, boundless like the mind, may embrace all the endless variety of the things of nature, in seeking to adapt them to the uses of mankind. Wherefore, then, should it not be the ambition of every mechanic, to keep himself on a level, by education, with those Mechanic Arts which I have shown rising to a higher degree of excellence than is generally assigned to them, and which, as I have said, required in their invention, and have displayed in their successive improvements more labor of the mind than of the body? Wherefore should not a noble attempt be made to refine trades into liberal arts, and by the increased and ever increasing application of the intellect to those trades, to command for them that consideration which, for so many centuries, had been withheld, because they were looked upon as pursuits to be carried on,

almost exclusively, by the process of manual labor.

But how came those useful arts, which led to the civilization of mankind, and which at first were the object of so much admiration that they were supposed to be the manifestations of divine intellect, to fall so rapidly into disrepute as to bring even contempt on those who exercised them? The reasons of this change strike me as the consequences of some facts, to which I call your attention. When the first Mechanic Arts were invented, men were free—they were hunters, shepherds, tillers of the ground. But when, for reciprocal protection, they formed themselves into associations, called tribes or nations, they soon began to war upon themselves as they had upon the wild beasts of the forests, and to reduce one another into a state of servitude. Hunting, which certainly is a species of war, had been the first occupation of man, and was thought to be the noblest of all those to which he subsequently addicted himself. When he became the owner of slaves, he soon relinquished to them the drudgery of manual labor or the Mechanic Arts, and reserved his hands for the exclusive use of the bow and the spear, to which he was indebted for the lordly command

he had assumed. Sprung from the free cradle of mankind, but nursed in the lap of slavery, the Mechanic Arts, in spite of this adverse circumstance, flourished to a considerable degree in Asia, and particularly in Egypt and Chaldea, where we still wonder at the gigantic fossil skeletons of the stupendous cities and monuments they erected. But these nations, great as they rose to be, were but a vast agglomeration of slaves, subjected to the dreaded will of a splendid despotism, cemented by force and often sanctified by religion, and there the Mechanic Arts were left to the most inferior classes—to the lowest in the hierarchy of slavery. It is not therefore in Asia, that the Mechanic Arts could command from mankind that position which they are now beginning to enjoy.

When civilization brought the Mechanic Arts into Greece, it had slavery for its travelling companion, and the same consequences followed —they were left to the slaves. The masters reserved for themselves what is called the Liberal Arts—the pursuits of the free—from the word *liber*. Hence the admiration of the world was for the Liberal Arts, and its contempt for the Mechanic Arts—the useful, but the menial and the slavish. The former were the privileged

occupation of freedom, and the glorious exemplification of thought gathering itself into a visible substance in all the diversified splendor of form and color. The latter were debased with the touch of servitude, and were looked upon as more or less ingenious specimens of manual labor, to which the intellect could not be supposed to stoop. Hence the estimate in which they were held in that loveliest portion of the earth, where life was all thought and feeling, and where poetry seemed to rise up like a natural exhalation from every object by which man was surrounded.

Thus the Mechanic Arts, although the eldest of the family to which they belong, and to the manor born, were stript of their inheritance by the Liberal Arts, which assumed the exclusive sovereignty of the world and claimed its undivided homage; and it is almost amusing to see the contempt with which they are treated by their younger sisters. This feeling was carried so far at one time, that, to pursue any Mechanic Art, and therefore to minister to the comfort of human beings, was thought to be more than a condescension, more than an humble office; it was looked upon as a degrading occupation, and, by some, as an immoral one, which ought to be

spurned by free and high minded men. If Democritus had discovered the principle of the arch, if Anacharsis had stooped so low as to imagine the wheel that was to help the potter in his labor, they were to be excused rather than to be eulogized for what they had done. Seneca, who had so much pretension to wisdom, would have considered it an insult, if he had been supposed capable of turning away from the pursuit of framing the stilts on which his inane philosophy and inflated morality walked so pompously in preaching their precepts, to waste a thought on the invention or improvement of a plough, a ship or a mill. That was good enough for his slaves or freedmen—it was too menial for himself—it was not a sufficiently imposing taxation on his mind, which could not consent to pay such penny tribute into the exchequer of humanity. But,—to justify the murder of a mother by an imperial son, to kiss the foot of the parricide in abject servility, to write moral essays on the same tablets on which he had recorded the panegyric of a monster; to indulge in the solemn mockery of praising poverty amidst the millions he had hoarded up, simplicity of life when owning palaces and gardens worthy of an eastern satrap, abstinence when reclining on the couch of

luxury, and liberty with the same voice which had hailed the divine Cæsar,—was a liberal pursuit, which slaves and freedmen could not be permitted to approach.

"Archytas," says Macaulay, in one of his essays, "had framed machines of an extraordinary power on mathematical principles. Plato remonstrated with his friend, and declared that this was to degrade a noble intellectual exercise into a low craft, fit only for carpenters and wheelwrights. The office of geometry, he said, was to discipline the mind, not to minister to the base wants of the body. His interference was successful; and, from that time, according to Plutarch, the science of mechanics was considered as unworthy of the attention of a philosopher."

In a later age, Syracuse being besieged, Archimedes, the celebrated mathematician, set fire to the fleet of the enemy by causing the concentrated rays of the sun to be reflected from a mirror of his invention, and spread terror among the invaders by the construction of engines which scattered death and havoc at a prodigious distance. But the sage thought that, to descend from the altitude of his learned speculations to the flat level of practical utility, was a sacrifice

of intellectual dignity which needed an apology, and he spoke of his improvements in the Mechanic Arts, either as derogatory acts, which had been forced from him by the necessities of the moment, or as trifling amusements into which he had allowed his mind to relax.

The destruction of the Roman empire, with the convulsions which preceded and followed that great event, were not favorable to the development of the Mechanic Arts, either theoretically or practically, and were not of such a nature as to procure for them a higher degree of estimation from mankind, when it was relapsing into the ignorance of barbarian life. In the feudal ages, those arts were left altogether to the serfs, and neither the iron clad baron, the cloistered monk, and the disputatious scholar, nor the fierce sectarian or religious zealot were disposed to favor those engaged in the Mechanic Arts, and ever thought that there was any merit in undertaking to increase by them the power, and to ameliorate the condition of the human race. It is only about two hundred and fifty years ago, under the reign of James the First, in Great Britain, that their importance and the consideration they deserved began to be appreciated. Then was preached the doctrine of

utility and progress, which has since been called the Baconian doctrine, from the name of its originator. That great innovator maintained that the end of science and art ought to be: "The relief of man's estate." It was: commodis humanis inservire: "To serve the interests of humanity." It was: efficaciter operari ad sublevanda vitæ humanæ incommoda: "To remove efficaciously the incommodities of human existence." It was: dotare vitam humanam novis inventis et copiis: "To endow mankind with new inventions, resources, and faculties." One of the most praiseworthy objects of the highest intellect was, in his opinion, that of teaching man how to use his hands, how to become a skilful mechanic, and how to improve the arts which are so indispensable to his existence and welfare, by the combination of theoretical and practical knowledge. Suiting the example to the precept, he said: "that, as nothing was insignificant that could minister to the slightest wants of humanity, and nothing too humble, provided it was useful, to be disdained by the intellect,* whatever of an

* Quique architectus fortasse in philosophiâ et scientiis esse debeam, etiam operarius et bajulus, et quidvis demum fio, cum haud panca quæ omnino fieri necesse sit, alii autem ob innatam superbiam subterfugiant, ipse sustineam et exsequar.

architect he might perhaps become in philosophy and the sciences, and whatever else he might happen to be, he would not disdain still to labor as a common workman and stone carrier, and do all those small things from which shrinks the vain pride of others." Thus Bacon aimed at a generous innovation in the ideas and feelings of mankind. He found the Mechanic Arts crouching under the depreciation which had kept them in a state of imbecile servitude, and every man of liberal education turning away from them with scorn, and thinking them unworthy of his attention. What had been the inevitable consequence of such a prejudice? It was, that many of the arts which were undoubtedly the most useful, and therefore of the most vital importance to the human race, and which, under the investigations of a scientific mind, were susceptible of the most wonderful improvements, had been unnoticed by the speculations of the intellect, and pushed aside as ignoble rubbish befitting only the manipulation of joiners, masons, smiths, weavers, and apothecaries. It was necessary to assert the primogeniture of those arts, to vindicate the dignity of their nature and of their rights, to assign to them the prominent post to which they are en-

titled in the van of civilization; and to proclaim in the words of one of the most brilliant of modern historians: "That, as they have a most serious effect on human happiness, they are not unworthy of the attention of the highest human intellect." Thus Bacon gave the first blow to remove the barrier that impeded the progress of the Useful Arts, and registered in the records of posterity the verdict of genius against that contempt of centuries which had assumed the prescriptive right of confining them within the narrowest sphere, and to keep those who exercised them for ever sunk to the lowest depths of society, in utter forgetfulness that those Mechanic Arts were coeval with the birth of man, that they had civilized him, and that, without them, those Fine Arts of which we are so proud, and which have monopolized the attention, the studies, and the admiration of mankind, could not have existed.

But were the Mechanic Arts deserving of the low estimate in which they were held, and is it true that the mind has less to do with them than the physical powers of man? To ascertain how much of mind there is in them, look at their results, and judge of the tree by its fruits. To him who may inquire what the Mechanic or Use-

ful Arts have done, I answer: they have purified the pestilential breath of disease, clipped its dusky wings, dried up many of its sources, ascertained the various character of the hateful family into which it diversifies itself, and have restrained, or conquered, if not entirely annihilated that relentless foe; they have deadened the sting of pain; and they have, as the tables of mortality will show, prolonged the duration of human life. If the soil round us blooms with more fertility—if the mariner ascends his bark with no hesitation, and dares the pathless ocean with as great a feeling of security as he gambolled in his boyhood round the paternal roof,—if the warrior uses weapons, in comparison to which the Lance of Achilles would be as insignificant and harmless as the bodkin used by a fairy's tiny hand—to whose influence is it due? If, at the command of man, the darkness of night has vanished from this very hall where we are assembled; if, in imitation of omnipotence itself, he could say: Let there be light—and there was light—whence does he derive that power? Let us, with the help of the imagination, and with its lightning speed, make a journey throughout the world. Here come we to a wide estuary, and no means of transportation is at hand.—But lo!

—materials of iron, stone or brick gather themselves up into a bridge of the most beautiful architectural form, and we walk over the foaming waves. Shall I tire you with the enumeration of the endless prodigies we shall witness? Do you wish to play with the thunderbolt of heaven—to see the most remote star that modestly twinkles behind the infinite host of fixed or moving orbs which have been flung like dust over the immensity of space—or to examine how many invisible beings a drop of water can contain? Do you wish to travel with almost viewless rapidity—to master all the elements—to annihilate distance—to remove mountains, to fly over their heights or to pass through their strong and compact ribs—to soar into the air,—to dive into the sea and walk at its bottom—to visit the gnomes in the frightful recesses of the earth—and to send to a friend who is a thousand miles away from you a message of love which he will receive in a few minutes? Do you want your carriage to whirl along without horses, and your bark to speed on, against the wind, without oars or sails? What other miracles do you want?—You have only to speak—and you shall be obeyed. But, before you depart, turn round to thank the Mechanic Arts, and say no longer

that "the body is more concerned in them than the mind."

The Mechanic Arts had not been properly understood. Otherwise, how could they have been despised, when their effect is to raise man almost into a God, by giving him empire over matter! Is it not sufficient for their rehabilitation, that their end is the greatest comfort and happiness of the human race? Is not the evidence of their intellectual essence in the mere fact that they make inanimate matter instinct as it were with life, that they appropriate to the use of man the plastic powers that lie latent in the womb of nature, and that they convert its substances, apparently the most worthless and common, into such gorgeous or delicate articles as may adorn a lady's brow or a monarch's throne. In the progressive discoveries by which the boiling water, bubbling up in a barbarian's caldron—the light and damp smoke it emitted—and the rough metal which contained it—were transformed into the complicated agent of power which we possess in the steam engine, is there not as magnificent a manifestation of intellect as in the most celebrated productions of the Fine Arts?

I have said that all the Arts belong to the

same family, and it would require no great effort to show that poetry itself is not unconnected with the Mechanic Arts. Can it be denied that no poetical imagination ever dreamed the realities with which they have surrounded us? Have they not actually produced things so strange, that they look as belonging only to the world of visions? Have they not surpassed in what they have written on the broad tablets of nature the descriptions of the Arabian tales? Have they not achieved feats more bewildering than those related in the romances that disturbed the brains of the knight whom Cervantes has immortalized? To use language which I find ready at hand, and which I borrow as being more elegant than any of my own: "have they not erected buildings more sumptuous than the palace of Aladdin, fountains more wonderful than the golden water of Parizarde, conveyances more rapid than the hippogryph of Ruggiero, arms more formidable than the lance of Astolfo, remedies more efficacious than the balsam of Fier-à-bras?" I hope I may be permitted to add: is not their sober reason more magnificent than the wildest dreams that ever came out through the portals of brass or ivory? What talismanic wonders are to be compared with the miracles produced by the

philosophy of the Mechanic Arts? Which of those incantations in which superstition formerly believed ever produced results so astounding? Have not the Mechanic Arts already accomplished some of those prodigies prophesied in the New Atlantis of Lord Bacon? Had any human being related, a century ago, that he had seen what every child witnesses every day as a common occurrence, would he not have been considered as deserving less credit than Baron Munchausen, or Sinbad the sailor?

When Fletcher put the following lines in the mouth of Arbaces, the Oriental conqueror:

> He shall have chariots easier than air,
> Which I will have invented; and thyself,
> That art the messenger, shall ride before him
> On a horse cut out of an entire diamond,
> That shall be made to go with golden wheels,
> I know not how yet . . . . . .

he was a poet—one who pursued a liberal art. But he who executed the poet's conception, he who gave an endurable and useful embodiment to those flitting visions of the brains, he who produced the fire-breathing horse and the golden wheels, when the poet "knew not how yet" it was to be done—is he not entitled to as exalted a seat as the poet himself on the broad platform

of the intellect; and is he not incommensurably his superior as to the benefit conferred on mankind?

I invite you to remark, that the Fine Arts have long reached perfection, and have ever since remained stationary, whilst the Mechanic Arts seem destined to expand beyond any of the limits which the imagination can assign to their march. Has Homer ever been surpassed? Can there be a more eloquent writer than Plato, more splendid orators than Demosthenes and Cicero, more sublime historians than Tacitus, and greater philosophers than Socrates and Aristotle? Has the sculptor Phidias ever been eclipsed? Will those who erected the Coliseum and the other architectural wonders of antiquity—will Michael Angelo, Raphael, Murillo, and many others, their peers in genius, ever acknowledge a master? Will the art of music ever find more admirable interpreters than Rossini and Meyerbeer? The human mind can readily imagine that they can be equalled, but cannot conceive how they can be excelled. But are you not convinced, from the experience of the past, and on the evidence of the present, which meets your eyes whichever way you turn, that there is no stopping point in the improvements of the Mechanic Arts?

If this be true, if progressive expansion without bounds be one of their constitutional elements, do I venture too far when I maintain that it is illogical to say, that they do not appertain to the domain of the intellect as much as the Fine Arts, which, for centuries, have been moving in a mere circle, luminous though it be, and worthy as it is of all the admiration of our race, of which they are the delight and solace? Is not the divine nature of man better exemplified, and is not his imperial destiny better demonstrated and established, by the limitless conquests made and to be made by the Mechanic Arts over the world of matter, on which they inscribe the title deeds and proofs of his sovereignty? This can no longer be denied, and thus for them has come at last the day of justice. Truly, indeed, may it be said of the Mechanic Arts, that their triumph is great—for they have conquered the prejudices of the world with the noblest of weapons—in striking them with admiration and gratitude, by the magnificence of their works, and by the blessings they have showered upon our race with the almost gorgeous profusion of divine benevolence.

Thus the celebrated Huygens, although he was the first mathematician and astronomer of his

age, did not blush, as Seneca would, at having discovered the means of rendering clocks exact by applying the pendulum, and of equalizing its vibrations by the Cycloid. That great philosopher and mathematician, Robert Hooke, would have scorned a Plato's remonstrance against his stooping so low as to invent the spring or pocket watch, and several other mechanical improvements. The learned Otto Guericke, who invented the air pump, and the honorable Robert Boyle, who improved it, never thought of apologizing, like Architas and Archimedes, for what they had done. A Howard, a brother of the Duke of Norfolk, did not think he was degrading himself into a slave, and that he was engaged in a base occupation, when he discovered a new process of refining sugar, "by which more money has been made in a shorter time and with less trouble and risk than was perhaps ever gained from an invention." Sir Humphry Davy did not feel, as Socrates himself might, that he was derogating from the majesty of the intellect, when he instituted a series of philosophical experiments, by which he constructed the safety lamp, with the assistance of which "the miner walks through a body of fire-damp in his subterraneous apartments without danger of explosion." Arkwright,

who had not originally received a regular scientific education, thought, no doubt, that he was following as noble and as intellectual a pursuit as that of any Greek rhetorician, when, for years, he went through an unwearied course of multifarious studies, to improve the spinning-jenny —that so remarkable and so useful invention of his, "by which a pound of the finest cotton has been spun by machinery into a yarn extending more than one hundred and nineteen miles." He who, by a certain combination of charcoal and saltpetre, produced one of the most tremendous powers with which man is armed, lived probably in the time of Petrarch and Boccacio. The inventor of printing was, it is believed, contemporary with Pope Nicholas the Fifth, with Cosmo de' Medici, and with a crowd of scholars, then distinguished, now sunk into comparative oblivion. But the prejudice which, for so many centuries, had been implanted in the human mind, had not yet been eradicated. Those two men, who had done more for mankind than all their contemporaries put together, were looked upon, it may fairly be presumed, as belonging not to the aristocratic circle of those who cultivate the liberal Arts, but to the plebeian class of those who pursue the Useful Arts, and are called

Mechanics. Hence it is not surprising that no one thought of inquiring their names, to record them for posterity. But if the inventor of gunpowder, and particularly the inventor of that art which has made thought visible and given it life and body for ever, were permitted to reappear on this earth, is there one among you who would not gaze on them with as much admiration as on any Nicholas the Fifth, Cosmo de' Medici, Petrarch, and Boccacio, that ever lived? This shows the change which has taken place in the human mind, and the existence of a more correct appreciation or estimation of the respective merits of the Mechanic, the Liberal, and the Fine Arts.

Nay—the march of the Mechanic Arts has been such, that if the old definition of them, which I have quoted at the beginning of this lecture, possessed originally a befitting exactness of description, it does not now seem so accurate in its application. You will recollect that the definition, acknowledged almost by all writers, is: "that the Mechanic Arts are those in which the hand and body are more concerned than the mind." Therefore its product, partaking of the nature of the producer, must be that in which there is more manual than intellectual labor. But is this the fact? On the contrary, is it not

well known that, frequently, the most exquisite product of the Mechanic Arts is that issuing from those manufactures which may be said to dispense entirely with manual labor, by the use of such machinery as works with little or no aid of the human hand, but only through the will of the human intellect. For this reason, the former scholastic distinctions established between the Arts ought to be abolished, and the old landmarks removed. The mutual assistance existing between the Arts is so great, their affinities are so strong, that they ought to blend harmoniously together in a democratic union, and disclaim all the pretensions of an unnatural hierarchy. Equals in rank, and with laurels crowned, hand in hand, and forming round man a radiant circle of love and protection, let them move on, satisfying his physical wants, refining his moral and intellectual desires, and gratifying his tastes for pleasure and beauty. The Mechanic Arts are the embodiment of the sober faculties—of the ratiocination of man—the ingenious tools of his patient and reflective industry. The Fine Arts are the fairy children of his imagination—the gems that dropped from the rich casket of the mind—the realization of the dreams of the soul. The former are the fruits of the tree of

knowledge—the latter are the flowers, and the delicate leaves, and the variegated hues with which it is embellished. In that little world of inventions which man is entitled to call his creation, the Mechanic Arts, although "formed out of the dust of the ground," like Adam, are, like him, "endued with sanctity of reason," and are "upright with front serene to govern" the world. They are made to

> Be fruitful, multiply, and fill the earth,
> Subdue it, and throughout dominion hold
> Over fish of the sea, and fowl of the air,
> And every living thing that moves on the earth.

To complete the comparison, I will say that the Fine Arts are, like Eve, "all grace, and dignity, and love,"

> With what all earth or heaven could bestow
> To make them amiable.

I hope that there is nothing in the observations I have submitted to you, which can, in the slightest degree, be construed into a wish on my part to diminish the favor of that worship which has always been paid at the shrine of the Fine Arts; and no one is disposed to bend lower than myself in the temple where the blest effulgence of their glory abides. Nay—who, in their presence, is not impressed with a sense of their

majestic loveliness and supreme excellence? Look at the dying gladiator—you forget the marble—you feel tempted to rush to the assistance of the quivering flesh and the streaming blood which you fancy before you, for

> He leans upon his hand—his manly brow
> Consents to death—but conquers agony,
> And his drooped head sinks gradually low—
> And through his side the last drops, ebbing slow
> From the red gash, fall heavy, one by one,
> Like the first of a thunder shower; and now
> The arena swims around him—he is gone.
> Ere ceased the inhuman shout which hailed the wretch who won.

Is not the whole scene as vividly before you, as if you were sitting in a Roman amphitheatre?

But stop, and beware of profane intrusion. Here is:

> The lord of the unerring bow,
> The god of life, and poesy, and light—
> The sun in human limbs arrayed, and brow
> All radiant from his triumph in the fight;
> The shaft hath just been shot—the arrow bright
> With an immortal's vengeance; in his eye
> And nostril beautiful disdain, and might,
> And majesty, flash their full lightnings by—
> Developing in that one glance the deity.

Is not the illusion complete? Do you not feel that you are in the presence of the Apollo of

Belvedere? And are you not indebted for it to poetry—the most beautiful, the most bewitching of the Fine Arts—the purest fountain of delight given to man, and where bubble up, invitingly to his lips, the perennial waters of immortality.

Shall I point out to you the Venus de' Medici—the dream of genius drunk with love—the cold stone made to breathe immortal grace, youth, and divinity—every perfection that visible substance can possess, gathered into a goddess—the divine forehead—the ambrosial lips—the soft curving lines of a body from which voluptuousness seems to exhale, as perfume from the rose?

Shall I attempt to describe the ecstasy which every one must feel at sight of the Coliseum, St. Peter's church, the cathedral of Seville, the Moorish Alhambra, and so many other architectural wonders? Shall I speak of painting—which makes us shudder at the agonies of the crucifixion, and fall prostrate, shrouding our face from the overpowering glories of the transfiguration? Shall I mention music, that lingering echo of heaven preserved in the human soul—which soothes even the fury of the maniac, and which has a voice equally acceptable to the prostration of grief and to the elation of happi-

ness? I have said enough to show that, if I claim for the Mechanic Arts a portion of that sovereignty which their favored sisters had hitherto exclusively exercised over the world, I am as willing as any one to pay the tribute of my allegiance, when passing before the throne on which the admiration of mankind has placed the Fine Arts.

This is but a brief sketch, inadequate to the merits of the subject—a flitting and vague shadow cast on the wall—the imperfect concatenation of a few thoughts, caught at random and on the wing, as they sped their hurried flight—the mere outline or indication, rather than the completion, of a picture. This lecture, defective as it is, closes at the point where I have conducted you—the rehabilitation of the Mechanic Arts in the estimation of mankind. In my next, I shall attempt to lay before you, in the same comprehensive manner, some further considerations connected with the influence those arts have had, and which they will continue to exercise on the destinies of the human race. This is but the portico of the edifice through which it will be my pride to escort you, on a future occasion, should you deem proper to honor me with your attendance.

SECOND LECTURE.

The Mechanic Arts, which are a subdivision of art, are themselves liable to subdivisions, which may be compared to the infinite steps of that ladder Jacob saw descending from heaven to earth. Those steps, however immense was the difference between the highest and the lowest, were indissolubly bound together by the same frame, and were equally trod by the angels. Thus does man, through the various gradations of the Mechanic Arts, proceed to comfort, happiness, and a higher state of intelligence. Hence, in assigning to every one his rank in the production, transformation, and distribution of such material objects as are suited to the satisfaction of the wants of our race, we first meet, as I have said in my preceding lecture, the hunter, the fisherman, the shepherd, the husbandman; and, ascending into a higher region, we find the artisan, manufacturer and engineer, whilst turning to the sea, our eyes rest on the shipwright and sailor. To designate by their proper deno-

minations all the artisans who are the fruitful progeny of the Mechanic Arts, would be to attempt a nomenclature almost without an end. The sons of industry count their numbers by legions; and I shall content myself with observing, that they may be divided into three great classes: Those who produce, those who transform, and those who distribute or carry. As to the materials on which they operate, they are contained in the boundless stores of vegetable, animal and mineral wealth to be found over the surface or in the bosom of the earth. As to the tools with which they have to work, they are the physical and intellectual powers of our race. Thus the producer, after having brought out the primary materials, lays them in the lap of him, who, with the assistance of manual, mechanical or chemical agencies, transforms them into commodities for the market of the world, and who, in his turn, hands them over to the carrier, whose task is to investigate the best, the safest and the most rapid means of transportation. Thus is made apparent to you the chain of affinity which links together those three great classes of operative industry, one single branch of which will illustrate the distinctions to which I allude, and exemplify the prodigious variety and degree of

physical and intellectual labor of which man is capable, in its application to one solitary material selected amidst the gorgeous profusion of those with which nature intends to stimulate our ambition.

Take for instance that apparently worthless and dull looking metal, called iron. As soon as man had the ingenuity to make it subservient to his uses, to how many different occupations did it not give rise?—The perforation of the ground to the level of the ore, the erection of pumps for drainage, the contrivances of ventilation, the hoisting of the whole mining apparatus, the bellows, the blast furnaces, the forges, the cupolas, the formation of the requisite steam or water power, the construction of bridges, canals, railways, harbors, docks, cranes, &c., for transportation, and all the necessary devices to overcome the forces of inertia, gravity and cohesion? But after the miner has extracted and sorted the ores, comes the engineer, who speeds to the smelting station, and delivers them to the iron master, who, in his sphere of operation, will, after having reduced them into cast iron, run them into rough pigs or regular moulds, which, under the plastic application of mechanical and chemical agencies, are transformed into bar and plate iron of all sizes

and shapes. The refining process still goes on, and the best iron bars are converted into steel by the cementation furnace, the forge, and the tilt hammer. We are next gratified with the production of tin plates, anchors, chain cables, files, nails, needles, wire, &c.,—and many other ever varying and fanciful or useful objects, in the hands of the founder, the cutter, the locksmith, the gratesmith, coachsmith, gunsmith, tinman, and other handicraftsmen who understand the manifold uses of this most valuable metal. Therefore, as you see, by the joint application of the physical and intellectual labor of man, this hard and unwieldy substance can be melted into a liquid and cast into any mould or form. It can be forged into chains that will bind Prometheus on his rock; it can be drawn out into the light but firm texture of the shirt of mail that will protect the warrior's breast, or into the gossamer gilt net that will keep captive the fairest silken tresses a lady's hair can boast. It will extend into plates or sheets; it will bend like the willow; it will soften into a cushion fit for the light slumber of childhood, and assume the elasticity of a spring to ease the motion of the invalid; it will harden itself into the metallic finger with which Franklin dared the

shock of heaven's thunderbolt, and sharpen itself into the keen edge of the sword with which Washington secured the liberty of his country. It is the obedient slave that waits on all our wants, our desires, and even our caprices. It fertilizes the domain of agriculture, and is equally indispensable to all the arts and sciences. It becomes as delicate as gauze, as light as air, and floats on the ocean. If in the shape of the cannon and the bomb it serves the angry passions of man, in the shape of a medicine it contributes to his health, and is so friendly to our race, that it is to be found in our blood, and constitutes a part of the elements which enter into our composition. For all these wonders, in connection with a single material supplied by nature, we are indebted to the Mechanic Arts. But in their application, even when thus confined solely to one object, what a variety of occupations! What gradations in the calls made on the intellect and on physical labor! What a diversity of operations—many merely modifying the shape or form of matter—some changing its very texture and constitution—others consisting in multiform, capricious, and exclusively physical manipulations—some which demand the greatest and sublimest effort of the

intellect—others which require none whatever. This applies to every branch of the Mechanic Arts. But, notwithstanding the diversity of their nature, they form a harmonious whole—a magnificent architectural structure, in which the vilest material is not without its utility, and is necessary to the general effect. Some of the rooms may be comparatively humble or small—more or less gilded and ornamented, and lighted up with less brilliancy—but they all belong to the same gorgeous edifice.

Let me here call your attention to the fact, that one of the happiest influences of the Mechanic Arts is to compel man to the study of nature in the pursuit of the gratification of his wants, and that the study of nature leads to the knowledge of God, to the establishment of religion, and to all its beneficial consequences.

Among the effects of the Mechanic Arts we must also count the multiplication and extension of property, and, consequently, the enlargement of the basis of civilization.

Socrates is reported to have said, that "those who want the least, approach the nearest to the Gods, who want nothing." This saying does not seem to me to be worthy of him who was declared by the oracle of Delphi to be the wisest

of mankind; for, were his sentiment correct, the savage would be the specimen of perfection among men and the nearest approach to the deity. The Mechanic Arts have proved the falsity of this remark; for, by the progressive multiplication and gratification of the wants of man, they have led him, in the aggregate, to the enjoyment of such physical comforts as he had never attained, and to a degree of intellectual cultivation which he had never possessed. Wants stimulate the intellect into action, and it is the enlargement of the mind, not the absence of the wants, which permits us to claim congeniality with the spiritual nature of our creator.

It is astonishing what a length of time this enlargement of the mind required, in spite of the incessant stimulus of our increasing wants! How many centuries were to elapse, before man should discover the elements of power which God had laid around him in so ostensible a manner! How interesting it would be to read line by line the history of his struggles, and to follow him step by step in his voyage of discovery, through the chaos of ignorance in which he was born, to that realm of regularity and light, where we see him possessing the knowledge of geometry—comprehending the laws of equilibrium

and motion, the composition, decomposition and application of forces, some too large for physical strength, others too delicate for human touch—enlarging old agencies, and creating new ones—studying the effects of air, cold, heat, water, elasticity, pressure—the interposition of substances—resistance—adhesion—and the effects of friction in its different relations with the nature and extent of surface, and its combinations of antagonistic position or affinity with bodies of different and of the same kinds! All this knowledge is now necessary to the Mechanic Arts, originally so simple, so rude, so despised, and apparently so unconnected with the intellect. Every sort of knowledge is now embraced by them—practical and theoretical—the geometry of the hands and the geometry of the brains—the geometry of the shop—and the geometry of the academy; for it is evident that he, who, in the vast field of the Mechanic Arts, should not possess both, would only hop along on one leg and proceed much slower and less safely than a competitor in whom the same deficiency did not exist.

In illustration of the preceding remarks, I do not hesitate to mention the laws of friction, and to say, that the most learned man, speculating

upon them in the closet, if he had never witnessed their effects, would not come to any conclusions of practical utility, and that all his calculations, in their application, would result in a series of blunders. A lever is a very simple thing, and yet how infinite the calculations to which its action may give rise, and how complicated its direct, or indirect, and remote effects in their relation to the things on which it may bear and by which it may be felt! How much time, labor and even genius have been wasted in the invention of wretched machines by individuals who imagined that levers, wheels, pulleys and cables would work in their application to matter, exactly as it had been arranged by the speculations of theoretical learning! If we every day hear of so many failures attending the investigations of the men of science, it is because they are deficient in practical knowledge, because they have not exercised their hands as well as their brains, because, satisfied with taking a profile or front view of a machine, they have not studied its anatomy.

It requires both practice and theory to acquire a peculiar knowledge which is exceedingly valuable in the Mechanic Arts—the knowledge of those machines which will work well only on

a large scale, and those which can operate only on a small one. But by what laws, and on the evidence of what facts, is this question to be solved? What are the absolute proportions beyond or within which a machine is defective? What is the exact medium? What is the true size of an excellent watch, of a perfect mill, of a ship combining all the qualifications of speed, strength, and duration? This is to be approximately determined by the experimental geometry of the handicraftsman, assisted by the theoretical geometry of the mathematician. In the accomplishment of this desired end, they are like two chemical ingredients, which are respectively inert, but which derive power from their combination.

In what system of natural philosophy, or of metaphysics, was there ever displayed more intelligence, more sagacity, and a greater amount of logical deductions and inductions than in the invention of those machines used to wiredraw gold, and in the operations of making lace, gauze, cloth, silk and velvet, in all the variety of texture, color, gloss and drawings in which they are brought to market? Can one imagine any thing more beautiful, more delicate and more singular than the many complicated pro-

cesses through which those results are obtained? Shall I take a more general survey of the marvellous productions of the industry of man, to show the necessity of education among those masses who are employed in the exercise of the Mechanic Arts? It is to that want of general education, to the absence of the combination of theoretical and practical knowledge, as well as to the causes I have already mentioned, that much of the slow progress of the Mechanic Arts must be attributed.

Those arts, however, as we must suppose, had arrived at a certain degree of improvement at the time when we hear of the construction of the tower of Babel, the confused multiplicity of language, the dissemination of the human race—and the deluge. From Noah to the siege of Troy, it is difficult to ascertain the number of centuries which elapsed; but, at that epoch of the existence of mankind, the Mechanic Arts had not done more than creep along slowly in the native slime of ignorance which covered the earth. Even when Homer composed his poems, there is no appearance that writing was known. Kings and princes prepared their own victuals, and were nothing but crowned butchers and sceptred cooks, and their wives, daughters and

sisters, no better than royal washerwomen and seamstresses. They ate with their fingers in the most unsophisticated manner; they did not know the use of such things as spoons and forks, and ignored such conveniences of cleanliness as table cloths and napkins. "They had no chimneys—no candles—no lamps. Torches are frequently mentioned by Homer, but lamps never." When the king of kings wished to spend a social evening with those heroes with whose names we are so familiar, a vase was placed upon a tripod, and chipt-wood was burnt in it to give light. The ships which carried the Greeks to the far-famed walls of Troy were but uncouth specimens of nautical skill, and mariners could, in those days, hardly lose sight of land, without thinking they were doomed to destruction. Much time passed off before the dull brains of Vulcan contrived the lock and key. The security of a bundle, the secrecy of a letter had to depend altogether on the inextricable combination of involutions into which a rope or a string was twisted; but we know what became of the Gordian knot under the sword of Alexander. Sandals were the nearest approximation to shoes, and against the profane invasion of dust or mud the divine ankles of Helena

could not claim the protection of stockings; warriors, whose memory is illustrious, rode their horses in the fashion well known to black urchins on our southern plantations—without the convenient appendages of saddle and stirrups. Plutarch reports* that Gracchus caused stones to be erected along the highways leading from Rome, for the convenience of mounting a horse, because, even at that time, stirrups were unknown in the Eternal City, though an obvious invention; and Cæsar himself, the master of the world, did not know the luxury of wearing linen.

We have the proof, however, that, from the siege of Troy to the greatest of human events—that which marked the Christian Era—some of the Mechanic Arts had reached perfection, and that many had been carried to a degree of improvement, of which we have not perhaps a full and just conception. Of what they were we can judge by their productions—and those productions we can sum up in a few words—they were such cities as Nineveh, Babylon, Rome, and others. But another deluge ensued—not cataracts of water—but of human devastation; all the fountains of the great deep of barbarian

* Thomas Dick on the Improvement of Society.

sway were broken up, and the windows of wrath were opened; and the rain of blood was upon the earth for ages. All the Arts were submerged; many of the secrets of human industry were lost; and civilization itself would have perished, if it had not taken refuge in the bosom of God's church, which, like the ark of gopher wood, went upon the face of the deluge. Although what we possess of the remains of antiquity does not convey to us as much knowledge as we might desire of the state of the Mechanic Arts in those days, particularly in their separate branches, yet we know what they had done in the aggregate for the civilization of man and the increase of his race. Take for instance Attica, where on the most barren and contracted of territories, measuring about 210 square miles, there lived a numerous population celebrated for its wealth, its wit, and its refinement. Allow me here to say, as a passing remark, that the history of the Mechanic Arts, from the earliest time of man's existence to the destruction of the Roman empire, if it could be had, would be more useful and more interesting to us now, than all the other histories put together, with which our libraries are so abundantly furnished. But whatever was the state of improvement and refinement reached

by the Mechanic Arts in the best days of antiquity, there are three discoveries to which they had not led:—the invention of printing—of making gunpowder—and the knowledge of the properties of the magnetic needle, which, by the social, political, and intellectual revolutions they have produced in the world, have been some of the most powerful causes of the advancement and promotion of the Mechanic Arts.

A ray of light having begun to penetrate the Cimmerian darkness which had overspread Europe, the Mechanic Arts strove to revive, like plants, which, brought out into the open air of which they had been deprived, turn their withered heads towards the sun. But in the republic of letters, all the sharpness and vigor of cultivated intellects were, by the force of habit, still confined to the pursuit of trifles; and the glorious task of improving the condition of the human race, by ministering to its comforts, and by the diffusion of knowledge, continued to be delayed. Those who undertook it, if any body did so knowingly, were, as I have mentioned, despised as mechanics, or ran the risk of being burnt as magicians. Witness what happened to Faust, who was one of the three men considered as the inventors of printing.

Under the reign of Louis the Eleventh, in the year 1462, Faust carried to Paris a number of Bibles which he and his partners had printed, and passed them off as manuscripts—the Art of printing not being then known in France. The sum usually obtained by the scribes varied from 500 to 600 crowns, and, at first, he sold for that high price his copies of the sacred book. But as few only could afford to buy at that rate, he afterwards lowered his pretensions to sixty crowns. The astonishment was universal, and no one could understand how those manuscripts, as they were thought to be, could be sold so cheap; but when he reduced the price to thirty crowns, in order to extend the market, all Paris was thrown into commotion. How could the modicity of the sum asked remunerate for the labor! Besides, was there not something passing strange in the uniformity of the copies! Was it not beyond human execution! Evidently some supernatural agency was at work. There was magic in the beautiful distinctness, symmetry, regularity, and similarity of those exquisitely ornamented leaves. The attention of the police was awakened, and the lodgings of the suspected sorcerer were searched—when, lo!—his crimes were proved beyond a doubt. There were found

in his possession too many Bibles to admit the possibility of their being copies made by human hands. It was clear that the assistance of the powers of darkness had been invoked. There was but one puzzling obstacle in the way of solving this question: How could they have dared, and how could they have been permitted to meddle with the Bible, and to lay their blasted fingers on the book of salvation? The naked fact was there, however; it could not be denied; and what strengthened conviction was the circumstance of the red ink with which the copies were embellished, and which was said to be the very blood the magician had drawn out of his veins to seal his pact with the devil. It was therefore seriously adjudged, that he was in league with the dreaded author of evil, and he was thrown into a dungeon to abide his trial for witchcraft; and probably he would have fared no better than those who, in that age, were laboring under such accusations, if he had not, in self-defence, made known the secret of his invention. Hence the tradition of Faust and the devil, which has been so beautifully worked upon by the genius of Goethe. Such were the scenes which occurred and the feelings which prevailed, not yet four hundred years ago, in one of the

most populous and most enlightened cities of Christendom. How wonderful has been, since that time, the march of the human intellect!—and to what is it to be attributed, if not, in a great measure, to the Mechanic Arts, and to their progressive improvements!

As long as the spirit of liberty was extinct in Europe, the Mechanic Arts seemed to slumber in the tomb in which it had been buried. "The houses of the poor, in England," says Holingshed, the historian, "were wattled and plastered with clay; and all the furniture and utensils were of wood! the people slept on straw pallets, with a log of wood for a pillow!" Henry the Second, of France, at the marriage of his sister with the Duke of Savoy, in 1559, wore the first silk stockings that were made in that kingdom; and a pair of black silk knit stockings was thought to be a present sufficiently royal to be offered to Queen Elizabeth, in the third year of her reign. The bridge Notre Dame over the Seine in Paris having fallen down in 1499, there was not a man in France who could undertake to rebuild it of stone. Even so late as the 12th century, very few houses were furnished with glass windows, which were not then considered as the necessary appendage of every building,

but as the introduction of a very great luxury. Edward the Third sent to three Dutch clock-makers a cajoling invitation to settle in England, and to exercise in his kingdom an art with which none of his subjects were acquainted. "The progress of agriculture had been so uncommonly slow," observes Kames in his History of Man, "that, in the former part of the reign of Henry the Eighth, there did not grow in England cabbage, carrot, turnip, or other edible root; and it has been noted that even Queen Catherine herself could not command a salad for dinner, till the King brought over a gardener from the Netherlands. It was in the year 1563, that knives were made in England, and pocket watches were introduced in that country only in 1577. Three years later, coaches were made known; before which time the imperial and haughty Elizabeth, on public occasions, rode behind her chamberlain. There was no saw mill before 1333; paper was made no earlier than the 14th century. The Art of reading made a very slow progress—so much so—that, to give it encouragement in England, the capital punishment for murder was remitted, if the criminal could but read, which, in law language, is termed benefit of clergy. One would imagine that the

Art must have made a very rapid progress when so greatly favored; but there is a signal proof of the contrary; for so small an edition of the Bible as six hundred copies, in the reign of Henry the Eighth, was not wholly sold off in three years." What a state of ignorance! What an intellectual apathy! What an indifference to moral improvement! And this was in the age of the chivalrous Francis the First, of France, of the politic Charles the Fifth of Spain—in that age which is celebrated in history as having been the era of the revival of the Arts, and especially of Literature!

This is a proof that the illiterate condition of a country is a sure indication of the corresponding state of the Mechanic Arts. But their progress is in proportion to every fortunate change of circumstances which rouses the people out of their intellectual torpor. When the sense of former abasement gives way to the proud consciousness of the possession of dignity and prosperity, a vigorous elasticity is imparted to the mind, which is communicated to every pursuit. It so happened in Greece, after all the brilliant events which dotted her territory with those flourishing republics of which the lingering rays of glory still illuminate the pages of history. So

it was with Athens, when her star culminated to its meridian under Pericles. The enlargement or contraction of the human mind, the progress, the immobility, or the retrograde march of the Arts, and the extent of freedom or servitude resulting from political institutions, are so many circumstances which act and react on one another, as it were by the ebb and flow of a magnetic current. Liberty develops the mind—the mind, as it expands, carries forward the Arts—and the Arts, by the light they diffuse, have a tendency to promote or maintain liberal institutions. In a state of enlightened prosperity, a national spirit is created, works of genius or taste are composed, useful discoveries are made in every Art and Science, the fire of emulation spreads from one breast to another, until it gathers up into a general illumination. Thus when the bloody Octavius became the clement Augustus, when, with the irresistible power of a victorious hand, he had mastered or destroyed all the elements of civil war which had desolated Rome, and when he had restored peace, industry, and all the other blessings so necessary to the welfare of society, his reign became an auspicious era for the Arts; and let it be remarked that, under Augustus, if the government was a despotism—

that despotism was a hidden one—preserving the forms of liberty. When it stalked abroad, under his successors, in all its naked hideousness, the Arts sickened and perished. They revived with the free republics of Italy—the free cities of Germany—the free cities of Flanders, which preserved so long their privileges and immunities in spite of the jealous enmity of the Dukes of Burgundy, and they struck deep roots among the Dutch, when those victims of oppression asserted those rights which brought them power, wealth and fame. The splendid and enlightened despotism of Louis the Fourteenth, or at least of some of his ministers, produced, to some extent, the blessings of liberty, and paved the way to the progress of Literature and to the improvement of the Mechanic Arts, which put in motion the hitherto stagnating waters of the public mind, and spread a desire of amelioration among those classes who were soon to shiver into atoms the hereditary throne of his race.

Improvements of every kind in England were promoted by the restoration of Charles the Second, weak, foolish and corrupt as he was, because the people were exhilarated by the impression that the wounds of the country were to be healed for ever. But it is only from the day

on which was accomplished that glorious revolution which put William and Mary on the throne, that the liberties of England may be said to have been firmly established, and that ample scope was given to the development of all the pursuits of industry. Ever since that time the spirit of liberty has been gaining ground, and, with it, the Mechanic Arts, even under the worst forms of government; and particularly since the achievement of our independence and since the French revolution, they have been making more progress than they ever did since the beginning of the world—so much so—that now an improvement in the Mechanic Arts is frequently a revolution throughout the world. What effect would the new production of a painting as beautiful as any of Titian's, or of a statue equal to any of the prodigies of sculpture which came out of the hands of Praxiteles, have on the happiness of mankind? But the destinies of the humblest barbarian in the most remote part of the earth may be affected, in less than a few months, by a discovery made in the Mechanic Arts by a Fulton, a Morse, or some other benefactor of the human race.

The march of industry has been such, that the tool of the Mechanic may be said to be now the

sceptre of the world, and that the superiority of a nation over all others would be surely the result of its ascertained superiority in the Mechanic Arts. It is also a fact worthy of notice—that the Liberal and Fine Arts can arrive at the greatest degree of improvement in a country where the masses are enslaved and impoverished, but where there exists a powerful and wealthy aristocracy; whilst, wherever the Mechanic Arts thrive to a considerable degree, they are sure to gain for the people liberty and prosperity—at least some portion of it, or, at the worst, some exemption from oppression even under despotic governments. Another fact which must strike the philosophic observer is, that emulation, that great cause of exertion in man, does not exist in relation to the Fine Arts—for their productions can no longer be excelled; but it is not so with regard to those of the Mechanic Arts, in which an improvement widens into other improvements, and seemingly as insignificant as a pebble when thrown into their deep waters, produces circles enlarging into others to which no limits are to be assigned.

Thus those who pursue the Mechanic Arts ought to feel ennobled by the consciousness of their being engaged in works of such importance,

that they are capable, in their results, of modifying the face of the world according to the will of the human mind. It is particularly the United States which may be said to be the destined home of the Mechanic Arts, and the seat of that power which they will ultimately extend all over the earth. The Patent Office at Washington shows the untiring zeal and the inventive genius of their votaries; and it is as much to our excellence in the Mechanic Arts as to the beauty of our political institutions which have secured the development of those Arts, that we are indebted for all our territorial acquisitions; among which California and New Mexico may be compared to two magnificent portals which have lately opened their wide gates to the introduction of American industry, American enterprise and American institutions over our whole continent from the Rio Grande to the Pacific, and, beyond its placid bosom, to those eastern regions of wealth, on the threshold of which we have already set the foot which never goes back.

Napoleon the Great called the English a nation of shopkeepers. He, no doubt, thought that we were a nation of mechanics, and so exalted was his opinion of our skill and enterprise, that he once said that the day would come when we

should cross the Atlantic in a sieve. We have done better; we have traversed all the seas in floating palaces not appropriated merely to the luxurious ease of a few privileged nobles, but to the humble wants of the masses throughout the world, and carrying away with them, within their hearts of oak, the seeds of liberty intermixed with the seeds of the Mechanic Arts, to be sown broadcast over the surface of the globe, and to enrich even its most sterile parts with the growth of human comforts and happiness.

Another of the blessings of the Mechanic Arts is their having, by the increase of the objects of commerce, multiplied the bonds of union among the nations, introduced new relations and removed prejudices, by almost annihilating the distance which separated them, and made peace so predominant an interest over the minor ones which are causes of division, that those nations are exposed to very few chances of collision. The construction of manufactures, railroads, canals, and other colossal works have absorbed the funds that the carrying of war would require, if waged by some of the great Powers of the earth, so that a hostile struggle among them would produce such a perturbation of the vital interests of mankind, that it would not be of long

duration. The Mechanic Arts are the pillars which support the complicated fabric of modern society, and there is a spirit on the watch which will not easily allow the blind Samson of war to shake them and to bury civilization under their ruins. Hence the present hesitation in the belligerent dispositions of Europe. The sword itself is made to think and reflect; it may fret in the scabbard, but before it leaps out, it is bound to consult the scythe, the plough, and the other engines of industry.

There are evils, however, to be apprehended from the excessive development of the Mechanic Arts, and from their exercising a sort of monopoly over the public mind. It is the "oversharpening of the appetite for property, which," as it has been observed, "although a great blessing in its nature, degenerates into a great curse when it transgresses the bounds of moderation." This seldom happened when the plain necessaries of life were the objects of exchange or barter, before money had become a medium of trade. But when money became the representative of every kind of property, it inflamed the covetousness which is innate in the human heart, and a sordid spirit tainted the cultivation of the Mechanic Arts. I have said that they had paved the way

to the Fine Arts, inasmuch as the researches of pleasure are apt to succeed the pursuit of the conveniencies of life. But when the Mechanic Arts are permitted to create too keen a feeling of cupidity in a people, the Fine Arts degenerate. Cupidity and intellect may invent a money-making machine, but will never be productive of those sublime inspirations of the soul which are necessary to the creation of a fine statue, a beautiful painting, or an epic poem such as the Iliad, the Æneïd, or Paradise Lost. The Fine Arts scowl upon that country where there is no other criterion of the merit of labor than what it will bring in dollars and cents, and where a man, before he addicts himself to any pursuit, puts to himself this question: will it pay? In such a country where "Mammon wins his way when Seraphs might despair," the Fine Arts droop and languish, because, as the cant phrase runs: "they don't pay."

I observed in my preceding lecture that, at the dawn of civilization, the Mechanic Arts had been contemptuously abandoned to the slaves. On the other hand, it is a remarkable fact that their success may lead back to slavery, and that, if one of their blessings is emancipation and the diffusion of comforts, one of their evils may be

servitude and famine, resulting from their overgrowth, and from their predominating over all the other purely moral, intellectual, and speculative pursuits of mankind. To be convinced that this is to be apprehended from their undue extension, from their usurpation of too large an interest in the consideration of society, and from their overexciting the appetite for wealth, one has only to look at the state of things existing in the manufacturing districts of certain communities, where nothing is to be seen but a vast agglomeration of abject poverty, vice and despair —the mockery of free will having no choice of action—starvation goading feebleness into labor, and the most energetic toil of the hand and the most painful sweat of the brow hardly relieving the first necessities of life. But the problem of cheap production is solved—an impetus is given to commerce—consumption takes a wider range —the capitalist draws enormous profits from his investments—the marked progress of the Mechanic Arts is quoted exultingly in official documents—and newspaper commendations are showered upon the prodigies accomplished by the national industry. But it is forgotten that bondage has been introduced in the land—a Shylock bondage—that which claims, not the

ownership of the whole structure of a man's body—God forbid!—but merely the pound of flesh nearest the heart—that bondage secured by a contract in which want is the seller, speculation the purchaser, and cupidity the drawer and recorder of the title deed—that bondage—the worst of all—by which a man becomes the slave of another without becoming his property, and in whose preservation his master takes no interest, because their ties and connexions are accidental and precarious, and because that master paid nothing for the miserable human tool whom he flings aside with careless contempt, or frigid indifference, when worn out and unfit for further use.

If it is true that the Mechanic Arts have civilized man by stimulating his intellect, it must be admitted that they are apt to brutalize and stultify him when every moral and intellectual consideration is sacrificed to the perfection of material products and to the multiplication of physical comforts; and if they facilitate the increase of our race, they remind us that the principle of evil is never far from the principle of good, by giving rise to all those social infirmities which are the natural consequences of an excess of population. Thus, in countries thinly peopled,

it is not uncommon to see the same man engaged in various arts or operations; and, as he cannot be equally expert in every one of them, he is often obliged to draw on his wits, and to supply his want of manual skill or training by taxing his mind and straining his powers of invention; and, besides, he is not unfrequently called upon to ascertain the various relations that may exist between trades, professions, or occupations, apparently dissimilar, and to find out the assistance which he may derive from that discovery. Under such circumstances the Mechanic Arts are a blessing, for they sharpen the intellect, and the labor which they impose on man is sufficiently remunerated to enable him to satisfy his wants. But, in populous countries, where the simplest art is split into parts—where, for instance, an incredible number of hands are employed in the single operation of making a needle, it is evident that this distribution of labor secures the rapidity, the cheapness and the perfection of the production, but the wages of each operative are barely sufficient to enable him to keep up the breath of life in an emaciated and sickly bodily frame; and the mind confining its attention to a single object, shrinks gradually into so contracted a space as to leave no room for thought

or invention; and we may easily understand how a man of the most splendid intellect, who, for the sake of procuring scanty morsels of bread for himself and family, should consent for years to do nothing else than roll a pack of thread round his index, would turn out to be an idiot at the end of his probation. He who has not been thrown into contact with the operatives in manufacturing districts which are celebrated all over the world, and who has not witnessed with a sickening heart the last spark of human intellect flickering dimly in the dull sockets of their brains, has no conception of the curses entailed on the overgrowth of population and of the Mechanic Arts.

Those evils are to be obviated by proper regulations, by an enlightened legislation, and by a moral as well as an intellectual education. Not only is education to be generally diffused among the masses to correct or mitigate the evils I have described, and to help the improvements of the Mechanic Arts, but also because all political power seems to be centring in those who exercise those Arts; at least it is so with us. The great bulk of the people of the United States may be said to be composed of Mechanics and Artisans—and it must be remembered that here

the people govern—and that, through the numberless channels of commerce, through the all pervading action of the press, through the example of that democracy daily issuing from their bosom and travelling abroad, and through many other agencies, their influence is extending over the world. Hence the necessity of general education, not only for the development of industrial resources, and to facilitate the pursuits of wealth, but also for purposes of government.

It is evident that, if in the middling and lower orders, a spirit of inquiry after knowledge were stirred up, it would lead to the introduction of many more comforts, conveniencies and improvements conducive to general health and happiness; that it would shed a new lustre on the face of society, and that perhaps in fifty years from the present time, the world would be greatly more changed for the better than it had been for centuries. Let therefore as much knowledge as possible be imparted to the great masses of mankind.—Let the conquests of the intellect be exhibited to them as the noblest; let them be persuaded that the foundation of libraries is as necessary as the institution of asylums for the blind, the sick, the orphan and the destitute; let them be encouraged to form themselves into

associations for mutual improvement and scientific researches. By such means their attention would be directed to intellectual improvement, and a taste would be created for the investigations and studies which it requires. An ample field still remains open for useful discoveries, and it may be explored with equal advantage by the Mechanic as well as by the man of Science. "The exertion of the ordinary powers of intellect possessed by the mass of society," observes a philosophic writer, "is sufficient for the purpose of prosecuting scientific discoveries, and the more the number of scientific observers and experimenters is increased among the inferior ranks of society, the more extensively will interesting facts and analogies be ascertained, from which new and important principles of science may be deduced." The great book of nature is accessible to peasants and mechanics as well as princes and legislators. They have only to read it, and all that is necessary is that they should be taught how to do so. All knowledge is the result of the observation of facts and of the concentration of the faculties of the human mind upon them, to draw all the inferences, deductions and inductions of which they are susceptible, by the process of ratiocination. Hence the necessity of

education to enable every man, in his sphere, however humble it may be, to make the most of every fact which may strike his attention, by submitting it to the test of intellectual analysis. The crucible of a polished mind ought to be put within the reach of every mechanic, to give him the chance of extracting from the common dross of his every day observations the pure ore of discovery and improvement; and, indeed, so far as discovery and improvement in the Arts may depend on accident or circumstance, the chances of the educated over the ignorant artificer are a thousand to one, and are also far superior to those of the mere speculative man of science who never engaged like him in practical operations, and who therefore cannot so readily perceive what may be useless, defective or unfit in any of the methods which the brain may devise as applicable to the use or modification of matter. To borrow a common expression: "he is in the way of good luck," and he can take every advantage of it, when it comes to him, should he possess the necessary information. It ought therefore to be the wish of every one who has at heart the improvement of the human race in every respect, and in connexion with all the Arts—particularly the most important of all—

the Art of government—to cause the stream of education to flow abundantly from the Alpine heights of society to its deepest valleys, and to make it reach all the lips that may thirst for its refreshing waters.

Thus, I believe, I may be allowed to say in conclusion, that one of the happiest results of the Mechanic Arts has been—that their pursuit has become so intellectual that they have made of the spreading of education through every class one of those necessities to which even the most despotic governments must submit, in order to keep pace with the improvements obtained in those nations where the public mind is unshackled and permitted to be enlightened. In our days, even emperors and princes vie with each other in building up palaces, not for the Sardanapalian minions of ease and luxury, but for the exhibition of the world's industry, and have erected the crystal focus of civilization, to which every mechanic from every part of the earth is invited to resort—to draw from it the flame of inspiration—and to receive, in the face of the congress of nations, amidst all the pomp, show and circumstance of royal splendor, the reward due to patient labor, to manual skill, to cultivated ingenuity, to scientific research, and to inventive genius.

In the preceding Lectures on the influence of the Mechanic Arts on the human race, having alluded to the advantages to be derived from a proper course of education, my object in reproducing this short address to the Graduates of the Centenary College of Louisiana is to call the attention of the public to a southern institution which is eminently worthy of its patronage.

TO THE GRADUATES OF THE CENTENARY COLLEGE OF LOUISIANA.

My Young Friends:—Invited yesterday to address you on this occasion, I have now come to comply with a request which does me so much honor. I have come, although weak from fever, pain, heat and fatigue. An address, delivered under such circumstances, and on the spur of the moment, must, of course, be very restricted in its range, and cannot be expected to embrace any general topic. It must be almost confined to complimenting you on the great and remarkable success yon have obtained in the course of

your studies, and this institution on having produced such pupils as you are. The academic degree* which has been so unexpectedly conferred upon me, must be—shall be—for ever, I hope, a connecting link between you and me, and I beg you to consider me, from this day, as one of your companions, of your fellow students and college friends. I feel that any compliment which I might pay you would be but a mere obolus, if compared to the large and rich tribute to which you are entitled. But a sweeter compliment to you than any which could fall from my lips, I am sure that you must detect in the expression of those kind looks which are fixed upon you—the looks of mothers, fathers, sisters, brothers and friends. They tell you, more eloquently than I could, that you have done well. Nor shall I turn round to your professors to say to them, that they deserve your gratitude and that of the country for the manner in which they have accomplished perhaps the noblest and most difficult of all tasks—that of imparting education. The commendation which might be valued by them, as a grateful return for the discharge of the arduous duties of the sacred mi-

* Master of Arts.

nistry to which they have devoted their lives, it is not in my power to give. Praise, to be acceptable, must derive grace and authority from the source whence it comes. It must descend with dignity from the spheres of superiority; and not strive to rise to objects which, from their elevation, are beyond its reach. No shrine is to be approached without an offering worthy of its sanctity, and the presentation of scentless flowers loses half of its merit. I shall therefore content myself with expressing to you and to your professors my thanks, for the gratification which you and they have afforded me, and for the joyful pride which I have felt since my coming to these classic grounds. With joyful pride indeed I see, that my native State is no longer justly exposed to the reproach of not being able to educate her youthful generations. That education is properly appreciated in Louisiana and in the South, witness this immense assembly, in which are so fully represented all the elements of talent, beauty, labor, industry and wealth, for which our commonwealth and our sister State of Mississippi are so eminently distinguished. That a scholastic education may be obtained in these Southern climes, as completely as in lands of more classic renown, witness the academic

honors and degrees which we have seen to-day so worthily bestowed—on *you*, not on *me*. No longer shall it be said, that our bright sun smiles only on agricultural and commercial wealth, but blesses not with fertility the fields of the intellect, which lie neglected and unproductive. No longer shall it be said, that all seminaries of learning in Louisiana are doomed to premature decay, like those plants whose growth is attempted to be forced in a soil uncongenial to their nature. The success of this Institution, which now may be said to have stood the test of time, is a victorious answer to the sneers of detraction. Louisiana will have her nurseries of learning, and, when asked for her jewels, she will, like the most favored among her sisters, point to her Colleges and Universities. It will —it is no longer necessary for parents to trust the education of their children to distant lands and to unknown professors, and Southern minds may now receive a Southern tuition. If the definition given of education, in quaint, but forcible language, by Montaigne, the celebrated French philosopher, be true—"that education is the moral and intellectual institution and formation of man,"—can there be a greater evil for a country, than to be under the sad necessity of

sending away the young scions of its population to another country, to be there morally and intellectually *instituted and formed into manhood*, at an age when the seeds of that early sentiment which ought afterwards to mature into patriotism, are so deeply laid in the soul by the mere influence of surrounding objects.

Even in 1742, when this country was a wilderness, and when savage tribes roamed on this very spot, where I see gathered round me the evidence of so much civilization, Bienville, the illustrious founder of New-Orleans, wrote to the French Government: "It is long since the inhabitants of Louisiana made representations on the necessity of their having a college for the education of their children. Convinced of the advantages of such an institution, they invited the Jesuits to undertake its creation and management. But the reverend fathers refused, on the ground that they had no buildings suited for the purpose, and had not the requisite materials to support such an establishment. Yet it is essential that there be one, at least for the study of the classics, geometry, geography, pilotage, &c. There the youths of the colony would be taught the knowledge of religion, which is the basis of morality. It is but too evidently demonstrated

to parents, how utterly worthless turn out to be those children who are raised in idleness and luxury, and how ruinously expensive it is for those who send their children to France to be educated. Moreover, it is to be feared that the Creoles thus educated abroad, will imbibe a dislike to their native country, and will come back to it only to receive and to convert into cash what property may be left to them by their parents." Thus wrote this remarkable man. But this evil, from which we had suffered so long in Louisiana, has now completely disappeared from the land, and you are the living proofs that an education, embracing all the departments of instruction, can be as thoroughly secured here as in any other part of this Confederacy. You have obtained a home education in our lovely South, and you need not leave it to visit other lands, except it be to increase your stores of knowledge, enlarge your hearts, refine your minds, and adorn and beautify the moral and intellectual structure already laid out, and composed of materials which can be improved, but in which it would be too late to make any radical change.

The end of education in man is happiness to himself and to others. Here therefore you have

acquired the first rudiments of that knowledge which is to be conducive to your prosperity, to that of your country, and of those beings with whom your existence is, or may become, intimately connected. In proportion to the degree in which you have profited by the education you have received, or are in the course of receiving, you will discharge with more or less zeal and success those social, moral, and political duties which will devolve upon you in the different careers which it may be your destiny to pursue; and then will be tested the solidity of the foundations of that education, which, perhaps, would rather be a curse than a blessing to you, if it did not rest on the two everlasting pillars of religion and morality. It is those foundations only which have been laid here, and every subsequent day of your life will add something to the superstructure which is to be erected upon them, and which they ought to be prepared to support. Here have been sown the seeds which will either prove abortive and perish in the ground, or germinate with luxuriance—bringing forth the rarest and most precious fruits, according to the cultivation which you may continue to give to the domain of your intellect, when you shall have no other tuition

than your own, and that resulting from the experience of human affairs; for, to the education of the College succeeds the education of the world, and the object of the first is to prepare for the second. That both may prove to be pure and undefiled sources of happiness to you, is the wish which I now feel rising from my heart to my lips, when I look at the bright array of your youthful countenances, which, I hope, will never be marked with those deep furrows so often left behind them on the human face, as the traces of their passage, by those cares, sorrows and anxieties, to which manhood is exposed.

It is your good fortune to live in a country, where the whole political and social system reposes on education; not the education of the few only, but of the masses. Here, no restrictions are imposed on the human intellect, and it claims the infinite for its domain. The love and pursuit of knowledge, and of the power which it confers, are so predominant with us, that the words—knowledge, prosperity, and the United States of America, seem to claim a natural and indissoluble connection. This country is nothing but an immense workshop, where incessantly plies the hammer of Liberty on the anvil of the Mind, striking out sparks which illumine the

world. In these labors you will soon have to take your part, each of you within his sphere of action. On leaving this sacred spot, where you have completed your academical studies and received the only education which is worthy of the name—that is, a christian, moral and classical education—rest assured that you will feel its benign influence through life, whatever be the social position which you may occupy, whether you bask in the sunshine of prosperity or sadden in the gloom of adversity; and that it will make the ills and joys which flesh is heir to, sit on you as if they were easy garments. Like the rainbow, and realizing its promises, it will encircle your existence, and add a still more vivid hue to those gorgeous colors with which hope decks the future; it will increase tenfold your natural energies, fill your hearts with holier desires and affections, expand your minds to the confines of the universe, and, at times, call down from heaven its most genial winds to fan your imagination into the conception of dreams—bright dreams—sweeter than realities.

Should you ascend the broad and elevated theatre of public life, it may suddenly reveal in you the patriot, the statesman, the orator, and the illustrious warrior. It may entitle you to

inscribe your name in the records of immortality, by enabling you to wield the pen of the historian, the poet, or the philosopher. It may carry you up beyond the earth, on the wings of astronomy, to listen to the music of the planets and penetrate into the mysteries of the celestial spheres. It may make you, as a mathematician, agriculturist, mechanician, or physician, or in many other ways, the pride and blessing of your country, and even of the human race. But should you never leave the shades of private life, you will find the same influence, like the White Lady of Avenel, watching over the destinies of your house. By quickening and refining the sensibilities of your soul, it will increase and multiply your capacities for enjoyment; it will make brighter the very fire of your domestic hearth, and sweeter the smile of your wife and the innocent look of your child; it will give dignity to the humblest avocations, facilitate success in everything you may undertake, procure for you the esteem and respect of your fellow-men, and, at the end of your career, you will discover that it has secured for you that which, in the words of the poet, should accompany old age—

"As honor, love, obedience, troops of friends."

So much for the influence of education, as applicable to the common run of life, checkered as it is with about an equal admixture of good and evil. But, my young friends, the love of truth forces me to tell you, that education, like everything which appertains to man, has its curses as well as its blessings. Education is the fire stolen from heaven. The penalty may be, to chain Prometheus to the rock, and let loose the bird of prey, to feed on his heart. But who would not prefer that sublime agony of a God, to the sensual and unreflecting happiness of the brute? Who does not admire that allegorical illustration of thought, wearing out the body, tormenting itself with its eagle beak, and writhing under the torture of ungratified aspirations? There are miseries of the soul, always concealed from the world's eye, that far exceed in intensity the pains inflicted by those physical adversities which it is more apt to understand and to condole with. The loss of rank, friends, family, power, reputation, wealth or health is what the world pities. The terrible and mysterious agonies of the soul are what it suspects not, and what but too often exists in those who are apparently happy, and even the objects of envy. The white robes of the purest virtue may be

stained by the venom of defamation; the most exalted genius may not be able to make itself known to the world, and may pine away in obscurity; whilst vice, strutting under the assumed garb of virtue, may obtain universal admiration, and the unfounded and arrogant pretensions of mediocrity be acknowledged as the claims and rights of superiority. How many hopes may be defeated! how many desires crushed! how many ties severed! how many affections blasted! how many deceptions discovered! how many illusions fled for ever! There are but too many moments when man, for protection and defence, must shrink within himself as within a stronghold, from which he can defy the whole world in arms; but that self cannot give him the shelter of which he stands in need, if it be not fortified and made invincible by education.

There may be such events in a man's life, as will convert his soul, his mind and his heart into the most exquisite instruments of torture. It was, no doubt, when alluding to such a case, that the wisdom of antiquity said: "A virtuous man struggling against adversity is a sight worthy of the Gods!" This means moral and intellectual, rather than physical adversity. Should such be the destiny of any one of you,

when grown into manhood, let him remember that there are evils which cure themselves; and that education, like the spear of Achilles, has its balm for the wounds which it inflicts. It must be recollected, that education is of a tripartite character, and that those evils I speak of can arise only from that part of it which is confined to the cultivation and development of the intellect. But relief must come to the sufferer from its two other component parts, which are religion and morality. With their assistance, he will fall within the description of the virtuous man, whose struggles against adversity are a sight worthy of the Gods. Through them he will know, that there may be joys in the sufferings of the martyr, and that, in the agonies of the soul and the tortures of the mind, there may be a sort of ineffable and indescribable sweetness. Thus will he be made aware of the bountiful amends and compensations allowed by Providence. Thus will he be made to feel that the sorrows of man, as well as the whirlwind and the lightning and the wrath of the elements, have their mission, and that there is in them a sublimity, which reminds us more forcibly of Him on whom our thoughts should always be fixed, than do the smiles of nature when lulled into repose.

I hope, however, my young friends, that you will never verify how much of truth there is in these sentiments, into the expression of which I have been insensibly betrayed, and which, on account of their uncheerful nature, may well be deemed unsuited to this occasion, but fit only for the philosophical consideration of maturer minds than yours. I dismiss, therefore, the subject to which I have briefly alluded, and I now take leave of you, not, however, without thanking you for the very kind attention with which you have listened to my remarks, and not without conveying to you my wishes for your future welfare, and the happiness of all those who hold a place in your affections—for, as I have said in the course of this address: the end of education in man is happiness to himself and to others. So may it prove with you, my young friends and fellow-citizens.